OXFORD
UNIVERSITY PRESS

NEW

COUNTDOWN

BOOK 3

TEACHING GUIDE

THIRD EDITION



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Introduction

New Countdown 3 is the sixth book of an eight-book course specially designed for the young mathematician of today's fast-changing world. It includes concepts introduced in earlier books (place value, the four operations, measurement, basic geometry, and fractions) to a more advanced level and introduces a range of new ideas: graphs, line segments, the perimeter, Roman number system, the use of the point in denoting money, bills and their preparation, and telling the time with increasing precision.

New Countdown 3 covers all the concepts recommended for class three learners. It also goes beyond them in a systematic and carefully graded way. As in the preceding books of the series, worked examples are provided for every concept introduced, and a range of practice sheets and Mathslab activities seek to guarantee the interest and involvement of every student.

New Countdown 3 comprises eight units, each containing work which can be covered comfortably in the time available for each term. We recommend that you follow the units in sequence.

New Countdown 3 has in fact, been designed to help your students make the transition from yearly years to primary and then secondary levels. At this stage, it is essential that every child in your class has a notebook ready as you work together through the book. The recall pages appear regularly in the text, and practice exercises are included in each chapter.

Starting from Book 3, the workbook style followed in early year books is changed to a textbook style. Thus, it is essential that each child has a notebook to write in, as he/she works through the book. Greater use of the board will be necessary to demonstrate new ideas. Tick-marks, stars, and smileys give children confidence that they are getting their work right and hence encourage swift progress.

About the Teaching Guide

The Teaching Guide offers extensive teaching ideas linked with curriculum and adaptable activities to different settings. The strands of the curriculum have been explained in an effective way as a support to teachers' teaching. Activities designed for maximum learning in the classroom and daily life are mentioned in each unit. Teachers have the liberty to use any of these or the one mentioned in the model lesson plan, or any other activity of their choice depending on the interest of the students and the time available.

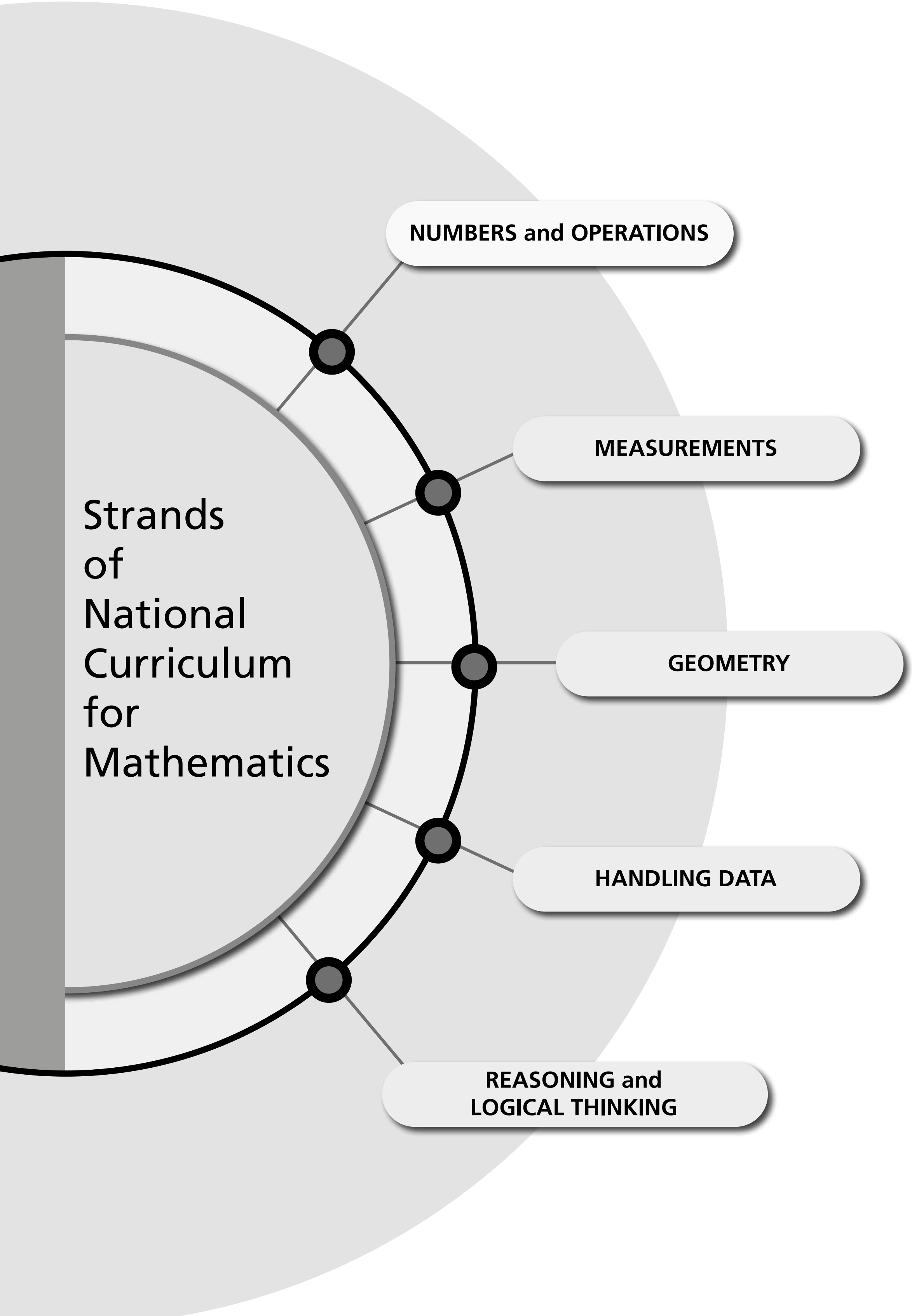
A syllabus matching grid is also given to facilitate the teacher connecting in the students learning objectives with the text in the book. The teaching guide emphasises the development of a positive attitude towards learning maths by enhancing memory retention, building concentration, and creating curiosity for maths. It contains a model lesson plan in each unit to implement time appropriate effective activities.

The most important feature of the teaching guide is its continued focus on the content of the Mathematics standards and this has been added in the Guide for teacher's guidance.

Planning your work and then implementing your plan are the building blocks of teaching. Therefore, this teaching guide provides detailed lesson plan, including learning objectives, learning curves, learning activities, and guidance to implement textbook exercises.

Use of resources are important to make the lesson interesting, engaging and easy to understand. Teachers can prepare their own material or use any teaching or learning aid easily available, as and when required.

Shamlu Dudeja


Strands of National Curriculum for Mathematics
NUMBERS and OPERATIONS
MEASUREMENTS
GEOMETRY
HANDLING DATA
REASONING and LOGICAL THINKING

Syllabus Matching Grid

Left column of the following grid indicates the National Curriculum SLO’s, whereas the right column indicates the text book units.

<table>
<tr><th>Unit 1: Numbers</th><th>Textbook Reference</th></tr>
<tr><td>1.1 Roman Numbers
i) Read Roman numbers up to 20.
ii) Write Roman numbers up to 20.</td><td rowspan="6">Unit 1</td></tr>
<tr><td>1.2 Even and Odd Numbers
i) Identify even and odd numbers up to 99 within a given sequence.
ii) Write even or odd numbers within a given sequence.</td></tr>
<tr><td>1.3 Place Value
i) Identify the place values of numbers up to 6-digits.</td></tr>
<tr><td>1.4 Numbers up to One Hundred Thousand
i) Read numbers up to 100 000 (one hundred thousand) in numerals and in words.
ii) Write numbers up to 100 000 (one hundred thousand) in numerals and in words.</td></tr>
<tr><td>1.5 Comparing and Ordering the Numbers
i) Compare two numbers using symbols ‘<’, ‘>’ and ‘=’.
ii) Write the given sets of numbers in ascending and descending order.</td></tr>
<tr><td>1.6 Number Line
i) Represent a given number on number line.
ii) Identify the value of a number from number line.</td></tr>
<tr><th>Unit 2: Number Operations</th><th></th></tr>
<tr><td>2.1 Addition
i) Add numbers up to four digits (with and without carrying) vertically and horizontally.
ii) Add numbers up to 100 using mental calculations strategies.
iii Solve real life problems involving addition.)</td><td rowspan="2">Unit 2</td></tr>
<tr><td>2.2 Subtraction
i) Subtract numbers up to four digits (with and without carrying) vertically and horizontally.
ii) Subtract numbers up to 100 using mental calculation strategies.
iii) Solve real-life problems involving subtraction.</td></tr>
</table>

2.3 Division i) Divide 2- digit numbers by 1-digit numbers (with zero remainder.) ii) Apply mental mathematical strategies to divide numbers up to the table of 10. iii) Solve real life problems involving division of 2 -digit numbers by 1-digit numbers.	
Unit 3: Fractions	
3.1 Common Fraction i) Express the fractions in figures and vice versa. ii) Match the fractions with related figures.	
3.2 Equivalent Fractions i) Identify equivalent fractions from the given figures. ii) Write three equivalent fractions for a given fraction.	
3.3 Proper and Improper Fractions i) Differentiate between proper and improper fraction.	
3.4 Comparing Fractions i) Compare fractions, with the same denominator, using symbols, ‘<’ , ‘>’ and ‘=’.	Unit 3
3.5 Addition of Fractions i) Add two fractions with the same denominators. ii) Represent addition of fractions through figures.	
3.6 Subtraction of Fractions i) Subtract two fractions with the same denominators. ii) Represent subtraction of fractions through figures.	
Unit 4: Measurement of Length, Mass and Capacity	
4.1 Length **4.1.1 Units of Length** i) Read standard units of length (kilometre, metre and centimetre) including abbreviations. ii) Measure and write standard units of length including abbreviations.	Unit 5
4.1.2 Addition of Units of Length i) Add measures of length in the same units with and without carrying. ii) Solve real-life problems involving same units of length for addition with and without carrying.	

4.1.3 Subtraction of Unit of Length i) Subtract measures of length in the same units with and without borrowing. ii) Solve real-life problems involving same units of length for subtraction with and without borrowing.	
4.2 Mass/Weight **4.2.1 Units of Mass/Weight** i) Read standard units of mass/weight (kilogram and gram) including abbreviations. ii) Measure and write standard units of mass/weight including abbreviations.	
4.2.2 Addition of Units of Mass/Weight i) Add measures of mass/weight in the same units with and without carrying. ii) Solve real-life problems involving same units of mass/weight for addition with and without carrying.	
4.2.3 Subtraction of Units of Mass/Weight i) Subtract measures of mass/weight in the same units with and without borrowing. ii Solve real-life problems involving same units of mass/weight for subtraction with and without borrowing.	Unit 5
4.3 Volume and Capacity **4.3.1 Units of Volume** i) Read standard units of volume (litre and millilitres) including abbreviations. ii) Measure and write standard units of volume including abbreviations.	
4.3.2 Addition of Units of Volume i) Add measures of volume in the same units with and without carrying. ii) Solve real-life problems involving same units of volume for addition with and without carrying.	
4.3.3 Subtraction of Units of Volume i) Subtract measures of volume in the same units with and without carrying. ii) Solve real-life problems involving same units of volume for subtraction with and without borrowing.	

Unit 5: Time	
5.1 Units of Time i) Use a.m. and p.m. to record the time (12-hour clock.) ii) Read and write time from analogue and digital clocks. iii) Read and write days and dates from the calendar.	Unit 6
5.2 Addition of Units of Time i Add the units of time in hours. ii) Solve real-life problems involving units of time for addition in hours.	
5.3 Subtraction of Units of Time i) Subtract units of time in hours. ii) Solve real life problems involving units of time for subtraction in hours.	
Unit 6: Geometry	
6.1 Geometrical Shapes i) Recognise point, line segment, and ray. ii) Classify figures according to number of sides as quadrilaterals, rectangles, squares, and triangles. iii) Identify circle, its radius, and diameter.	Unit 7
6.2 Perimeters Calculate perimeters of squares, rectangles and triangles.	
Unit: 7 Handling Information	
7.1 Pictograph Read and interpret a picture graph.	Unit 8

Note: The topic of Money has been introduced from the beginner's level.

In Book 3, Unit 4 explains the topic of Money with further enhancement, to help students apply their knowledge to daily-life experiences.

Teaching Mathematics at Primary Level

Teaching the Strands

To teach maths skills at primary level, the teacher should use multiple teaching methods to maximise students learning. Maths activities such as counting, sorting, organising, and pattern making etc. are sources of engaging students in their learning. The knowledge of maths skills at the primary level may forecast the achievements of math skills in the future.

Materials which give hands-on experiences such as solid shapes, abacus, clocks, and place value blocks, number lines, the place value chart, and play money should be provided to students to make connections to their learning. It is essential to check that each child has mastered the topics previously taught and is confident about handling them before you proceed to teach new topics. Review activities relating to place value need special emphasis. Here are my suggestions for practical activities and teaching ideas designed to reinforce learning and add interest, variety, and a practical dimension to your classes.

Numbers and Number Operations

Roman numerals (pages 2-5) offer plenty of scope for imaginative, activity-related teaching. For example, ask your class to set maths homework, based on Roman numerals, for Roman children living 2000 years ago.

When introducing 4-digit – 6-digit numbers, make sure you review place value thoroughly. Give your students plenty of practice in identifying the different parts of these numbers (pages 26-29.)-using expanded form notation reinforces understanding of place value here. Skip counting is a concept tailor-made for class team games: for example, teams A and B take it in turns to skip count in 2s, 3s, 4s, 5s, 10s, 100s, and 1000s from a given number, earning points for correct answers and losing them for errors.

Some students have difficulty in setting out sums involving big numbers; they may write their columns inaccurately or position their place values wrongly. Set plenty of addition sums involving 3-digit and 4-digit numbers, writing them on the board in horizontal form and ask the children to write them in vertical form in their notebooks. Then check that the columns have been set down accurately. Remember,

too, that children often forget to 'carry' the ten changed from the ones columns to the tens column, or the hundred changed from the tens to the hundreds. Encourage them always to record the changed number (pages 36-39.)

In subtraction sums involving changing, make sure your students always record their changing thus:

```
  6 5 0 0
– 1 8 0 0
---------
  4 7 0 0
---------
```

You may need to spend extra time on sums whose ones, tens, and hundreds places are to be changed by borrowing one, ten, or hundred.

As your students move on to more advanced multiplication work, make sure they record the tens and hundreds they 'carry' to the next column. Discuss the use of the term 'product' to describe the outcome of multiplication sums. Make sure you emphasise the point that when a number is multiplied by 10, the same digits appear in the answer, but each is one place to the left. This simple but important rule will help your students master decimal fractions when these are introduced in Countdown 4. Emphasise, too, what happens when numbers are multiplied by 100. Multiplicands with 2 digits should present no problems provided students remember to do the two parts of the operation (i.e. multiplying by the ones, then by the tens) separately, noting down the two products and then adding them.

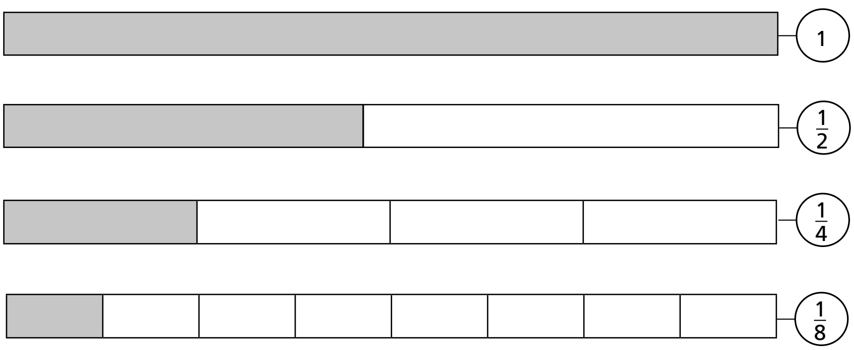
As you enter the section on division, check once again to make sure every child is confident of the multiplication facts up to $10 \times 10 = 100$. Also recall the terms 'dividend', 'divisor' and 'quotient' (page 83). When introducing the remainder (pages 86–87), ensure your students have access to small objects (buttons, seeds, beads) which they can divide in the same way as shown on page 86. The long form of division is easily mastered once children understand that they must record each stage of the operation, and be very careful with their columns. The process is started within the known multiplication facts and with no remainders (page 85). By page 93, students are asked to copy and complete sums: ensure that they do so neatly and accurately. Do not forget to link up dividing by 10 with multiplying by 10.

Fractions

Emphasis is given to fractions, which was introduced in Book 2 as a whole number or set divided into a certain number of equal parts. It is essential that students remember and internalise this basic idea as they progress with fractions. They also need to understand the notation used to express fractions and be very clear about the meaning of equivalence. Before starting the recall of fractions on page 100, make sure your students have strips of sheets of paper to fold and cut, as they did when

learning about 'halves' and 'quarters' in Book 2. Ask each child to fold his/her strip into quarters and then cut. He/she holds up first one quarter, then two quarters, then three quarters and, finally, four quarters. The notation for each fraction $\frac{1}{4}$, $\frac{3}{4}$, $\frac{4}{4}$ is shown on the board. Four quarters should again be held up to emphasise the fact that the four quarters make a whole. Now proceed to the recall exercises. Collections of small objects (beads, buttons, seeds) can be used to demonstrate the division of sets into quarters. Ask the children to show $\frac{1}{4}$, $\frac{2}{4}$, and $\frac{3}{4}$ of a collection. When introducing other fractions (page 105), be careful with the use of language: say 'one fifth' not 'one over five', and 'one eighth', not 'one over eight'. This reinforces your basic point about fractions involving equal parts. The choice of language is also important when you explain the terms 'numerator' and 'denominator': you may want to use the words 'top' and 'bottom' to help children distinguish one from the other (page 109).

Equivalence (page 110) is a very important aspect of fractions, and a fraction board will help you introduce the concept. To make your fraction board, prepare four strips of thick paper, all of equal length. Leave one strip whole, cut the next in half, the next into quarters and the last into eighths. Now pin or tape your single, uncut strip onto your board, and write a '1' under it. Next, take the strip divided in half, show the children the two halves, pin them up beneath the first strip, and write $\frac{1}{2}$ under each part. Continue the exercise with the strip cut into quarters and the strip cut into eighths. At the end, your board will look like this:



Discuss the fraction board with your children. What patterns do they notice? Write down your findings: for example,

$\frac{1}{2} = \frac{2}{4} = \frac{4}{8}$ and $\frac{3}{4} = \frac{6}{8}$.

Other boards can be made for thirds and sixths, and for fifths and tenths (page 117). The fraction board is also useful for comparing unlike fractions page (112). The students will quickly spot that $\frac{1}{2} > \frac{1}{3} > \frac{1}{4} > \frac{1}{6}$, $\frac{1}{6} > \frac{1}{8}$ and so on.

Money

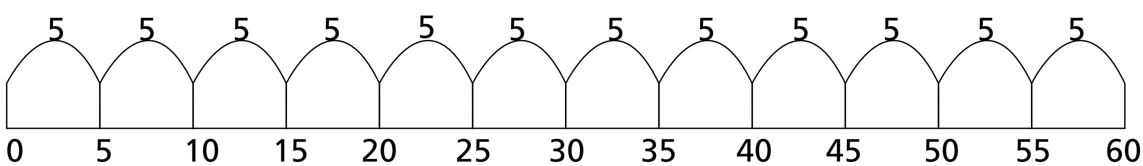
In the unit on money, the decimal point is introduced (but without the term ‘decimal’ yet attached to it). At this stage, simply explain to your students that the point separates the rupees from the paise, thereby making the notation of money simpler and neater. It is important to stress that the point must be followed by two digits in the paise portion (for example, Rs1 and 5p is written Rs1.05). Bill-making offers plenty of scope for learning-through-fun. Ask your students to plan their own restaurant menus, and then prepare bills for the items, as shown on pages (128–129).

Measurement

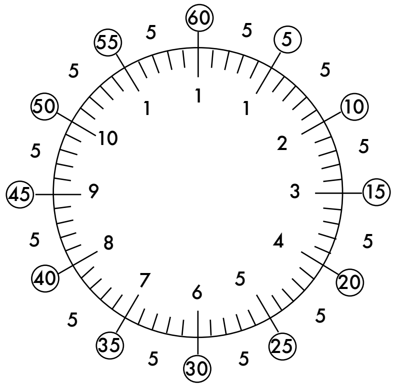
Measurement is the establishing of length, weight, or capacity of something. You can measure time, weight, height, temperature, length, speed, and more. Tell them life becomes so much easier when they know how to measure things, and that is why measurement is so important. Although measurement is an important part of everyday life, students don’t automatically understand that there are many different ways to measure things. They have already experienced how to measure length, weight, and capacity. Encourage them to add and subtract the standard units of measurement. To give the students hands-on experience you have to collect different material, like a metre rule, scale, measurement tape, weighing balance, and graduated jug or cylinder. Moreover, ribbons of different lengths, heavy and light objects, and containers of different capacities should also be collected. The students should be allowed to deal with the material whenever they have time.

Time

When you reach the section on time, remember that children need to understand the use of minutes and the way in which they are read from the clock-face. Use your cardboard clock-face, with each minute clearly marked, to show the children the 60 minute divisions; each minute mark should be pointed at in turn and counted from one to sixty. Practice counting in fives up to 60 should then be given, perhaps via a number line.



The fives can also be shown as multiplication sums, thus: $5 \times 1 = 5$, $5 \times 2 = 10$, $5 \times 3 = 15$, etc. Link the circled numbers with the numerals shown on the clock face (page 167). To show the idea of fives even more clearly, draw the clock-face on the board or on a large chart.



You can now develop the idea of ‘past the hour’ and ‘to the hour’ (page 167). Draw a clock-face divided into different coloured halves. Draw hands at different positions and ask the children to tell the time. You will need to give plenty of time and attention to the quite difficult idea that (for example) ‘10 minutes to 5’ can also be written as 4:50. Develop class team games of your own to reinforce the point and make telling the time enjoyable.

Geometry

Here, the geometrical concepts of side, face and vertex of 2D shapes, introduced in Book 2, are explored further. To help children grasp the properties of shapes shown on page (188-190), ask them to prepare strips of paper. They can then make the same shapes. Plenty of practical work should accompany the introduction of line segments, so that children become steady and accurate in their use of the ruler. To help reinforce understanding of the perimeter, certain suggestions for practical work have been included (page 199). The measurement section of New Countdown 3 builds on concepts presented in earlier books, and it is important to check that every student remembers that 1 metre = 100 cm, 1 kg = 1000g, and so on. The circle has been introduced to identify its parts i.e. centre, radius, diameter, and circumference. The knowledge of semi- circle has also been given in this unit.

Handling Information:

When introducing graphs (page 115), ask students to draw picture graphs of their own: animals in a zoo, different coloured cars in a garage, and so on. Then ask them to prepare column graphs showing the same information (squared paper should be provided for this). After the students complete the birthday graph suggested on page 116, ask them to think of other information that can be shown simply by graphs: for example, the number of siblings each child has; favourite flavours of ice-cream (How many like chocolate best? How many prefer strawberry? and so on).Generally, students enjoy graphical work and take pride in producing neat, tidy and colourful work. Don’t forget to display the graphs in your classroom.

Developing a Positive Attitude towards Mathematics

The journey till now in the New Countdown series has been very useful in exposing children to new concepts. Apart from having learnt numbers and newer strategies of working with them, the children are now able to grasp new topics. They can now work independently and their minds are ready to absorb more. New Countdown 3 follows the same activity-based 'visual' format of the previous books in the series.

The primary aim of the New Countdown series is to ensure that every child develops a strong affinity for mathematics (as against a fear for it). And, for this, the following are necessary:

A tension-free and fun-filled atmosphere

Concentration building

Logical thinking

A questioning mind

Ability to answer without hesitation

A retentive memory

A sense of discovery (rather than 'being taught')

Lateral thinking

Tension-Free and Fun-Filled Atmosphere

Such a learning environment establishes greater bonding between the students and the teacher and leads to healthier mental growth, greater confidence and better learning. Being in a comfortable, familiar, and friendly environment itself, builds confidence.

The more confident a student is, the easier it is for him or her to absorb new concepts, as the year progresses. It is firmly believed that students begin to get more joy by learning new concepts through discovery. If the lessons are based on such mores, there is no reason why the student will not grow up to be a happy and caring child with a bright, thinking mind.

Concentration Building

A student cannot perform well in the classroom if s/he is not attentive, distracted, or facing difficulty in focusing on the work at hand. Concentration or attention enhances students' understanding and retention. Mostly students will concentrate on fun activities, but it is crucially important to concentrate on all kinds of tasks done in the classroom to improve learning and build confidence. Given below are some strategies to enhance the concentration span in the classroom.

- Set an appropriate amount of time to complete the task. This may bind a student to focus on the given task so that he\she could complete it within set time limits.

- Divide a big task into parts, as shorter amounts of time and one task at a time may become an easier job for the students. A big task requires a longer time and more concentration and focus that may become a reason for distraction.
- Give them enough physical activity to avoid restlessness and make it easier to focus on the task.
- Allow some free time before beginning a new task.
- Reinforce positive behaviour.
- Introduce a reward system by praising the students or allowing them time to read their favourite book.

Some games may be helpful to increase concentration span:

- Just Sit: This game is played by challenging the students to sit in their chairs without moving to see how long they can do it.
- Statue: The teacher says 'statue' and everyone will be still in whatever position they are, for a few minutes.

Like any skill concentration can be built and improved with consistency.

As students grow older, building concentration becomes imperative. To keep them focused, it is the teacher's responsibility to plan their lessons to be interesting and full of variety. Try to create a visual environment. Ask students to rate their work and keep an eye on managing time during activities.

Logical Thinking

Every page in all the books in this series lays stress on logical thinking. The moment a student gets into 'logic' mode, thought, concentration and retentive memory will be the natural outcomes.

A Questioning Mind

If we want our students to be above-average achievers, we should encourage them to ask as many questions as they wish to. A question from one student will invariably lead to more questions from other students in the class. This is a very healthy outcome.

Ability to Answer Questions without Hesitation

It is important for a teacher to get into question-answer sessions with students, as often as possible. The mother of a well-known intellectual recently said that the reason for her son's brilliant performance in life was that he always asked too many questions and offered to give answers even when he was not specifically asked. The habit of trying to answer as many questions as possible should also be inculcated.

A Retentive Memory

Any kind of learning which is based on concentration, logical thinking, asking questions and finding answers will automatically lead to retentive memory. The power of retentive memory as a tool for learning at any stage in life can never be undermined.

Rote learning, uses two senses at the most—listening and seeing (reading), whereas activity-based learning, involves touching (doing) all the time, in addition to listening and seeing. The greater the number of senses used for a learning exercise, the better will be the concentration leading to improved speed of understanding, retention, logic, and application.

It would be great fun if the art and craft classes, off and on, incorporate mathematical shapes, concepts, and language. The joy that children derive out of such a learning experience is an added bonus.

A Sense of Discovery

Discovery is always more joyous than being told. If a mother tells her son that his teacher loves him, the son believes her, but if he discovers the teacher's love through a hug or a pat on the back, imagine the joy. The same applies to learning in Mathematics.

The sense of joy or pleasure at discovering new things, which is missing in rote learning, is a great accelerator for learning. Each discovery is the result of a practical activity.

Lateral Thinking

By this time students know several number facts and are comfortable with addition, subtraction, multiplication, and division. Concepts such as multiplication being a form of repeated addition, and division being a form of repeated subtraction, are used in everyday life without the necessity of going back to the basics. This is an example of lateral thinking.

Vertical learning would be to learn 2s tables, then 3s, then 4s and so on. Lateral thinking would entail understanding the facts behind the tables and applying these to solve everyday problems. In today's times, more than ever before, it is important that students think, learn to think and apply their knowledge laterally, i.e. they apply the knowledge gained from the books to their environment, throughout the day.

Features of the Teaching Guide

Suggested Time Frame

The guide provides a suggested time frame. However, every lesson is important in shaping the behavioural and learning patterns of the students. The teacher has the discretion to either extend or shorten the time frame as required.

Learning Curve

The guide identifies concepts taught earlier or, in effect, revises prior knowledge. Revision is essential, otherwise the students may not understand the topic fully.

The initial question when planning for a topic should be how much do the students already know about the topic? If it is an introductory lesson, then a preceding topic could be touched upon, which could lead on to the new topic. In the lesson plan, the teacher can note what prior knowledge the students have of the current topic.

Each topic is explained in detail by the author in the textbook, supported by worked examples. The guide defines the specific learning objectives of the topic. It will also outline the learning outcomes and objectives.

Real-life Application

Today's students are very proactive. The study of any topic, if not related to practical real-life, will not excite them. Their interest can easily be stimulated if we relate the topic at hand to real-life experiences.

Frequently Made Mistakes

It is important to be aware of students' common misunderstandings of certain concepts. If the teacher is aware of these, they can be easily rectified during lessons.

Summary of Key Facts

Facts and rules mentioned in the text are listed for quick reference.

Suggested Activities

This teaching guide provides you enough of suggested hands-on activities for making your lesson plan more interesting and engaging. Hands-on activities will have more impact on student's effective learning.

Model Lesson Plan

Planning your work and then implementing your plan are the building blocks of teaching.

Teachers adopt different teaching methods/approaches to a topic.

A model lesson plan is provided in every unit as a preliminary structure that can be followed. A topic is selected and a lesson plan written under the following headings:

Topic

This is the main topic.

Duration

The suggested duration is the number of periods required to cover the topic. Generally, class dynamics vary from year to year, so flexibility is important.

The teacher should draw his/her own parameters, but can adjust the teaching time depending on the receptivity of the class to that topic. Note that introduction to a new topic takes longer, but familiar topics tend to take less time.

Specific Learning Objectives

This identifies the specific learning objectives of the topic being taught in a particular lesson.

Key Vocabulary

List of mathematical words and terms related to the topic that may need to be pre-taught.

Resources: Teaching and Learning Aids (Optional)

This section includes teaching and learning aids used in a lesson plan. It could be objects and models, exercises given in the chapter, worksheets, assignments, or projects.

Strategy

Starter: Engagement Activity

The lesson can begin with something interesting, such as telling a story, relating a real-life experience or an everyday event which is related to the topic and is interesting enough to capture the attention of the students. Involving students in a discussion to find out how much knowledge they have of the topic being taught is also a good strategy. Teachers can use their own creativity to come up with ideas to create a sense of fun.

Main Developmental Activity

Learning needs to start with practical activities, therefore the main developmental activity is the first step that leads to actual learning, which in turn leads to the required outcome of the lesson. This activity can be planned as individual work, pair or group work. Working individually creates self-confidence where the students enjoy a sense of self-achievement, whereas pair and group activities create a sense of discovering and learning together.

These activities enhance concentration and improve retention of facts. Through these activities, the teacher can build understanding of concepts in a fun-filled way. It is easier for students to grasp the concepts and then move from concrete to abstract.

Written Assignments

Finally, written assignments can be given for practice. It should be noted that classwork should comprise sums of all levels of difficulty, and once the teacher is sure that students are capable of independent work, homework should be handed out. For continuity, alternate sums from the exercises may be done as classwork and homework.

Supplementary Work (Optional): An activity or assignment could be given. It could involve group work or individual research to complement and build on what students have already learnt in class.

The students will do the work at home and may present their findings in class.

Wrap up

At the end of each lesson, summarise the whole lesson. Make sure that the wrap up is not a repetition of the lesson. It should leave students with a sense of accomplishment–that they have learnt something new or important.

1 Number

Suggested Time Frame

10-12 periods

Learning Curve

Students have already learnt to identify the place value of numbers up to 3 digits. In the light of their previous knowledge they will read and write numbers up to 6 digits. In Grade 3 they have learnt to write 3-digit numbers in expanded form, they have also ordered and compared 2-digit and 3- digit numbers. Now, they will learn to read and write numbers up to 6 digits in numerals and words. They will also be able to compare two numbers using symbols, write numbers in ascending and descending order, represent and identify a given value of number on a number line.

They may have seen the Roman numbers on clocks and watches. They learn about the letters of the alphabet, which represent different Roman numbers and the order in which they are placed.

Real-life Application

Numbers are seen everywhere in our daily-life. We find numbers on price tags, phonebooks, and house addresses. Numbers are also found as page numbers in a book, age of people, in buying and selling, measuring length, weight, and capacity, and many more.

Frequently Made Mistakes

- Students generally get confused between the symbols of greater than and lesser than, while comparing numbers.
- Sometimes the terms successor and predecessor are not clearly understood.

Summary of Key Facts

- Even numbers are exactly divided by 2. They end with 0,2,4,6 or 8.
- Odd numbers are not exactly divided by 2.
- The numbers 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9 are called Arabic numerals.
- Romans used 7 letters of the alphabet to represent numbers i.e. I, V, X, L, C, D, M.
- For comparison of numbers, first check the place values of thousands, secondly, the hundreds, then check the tens and lastly, the ones.
- When numbers are arranged from smallest to the greatest, they are said to be in ascending order.
- When numbers are arranged from greatest to the smallest, they are said to be in descending order.
- The number that comes just before a number is called the predecessor of that number ('pre' means before.)
- The number that comes just after a number is called the successor of that number ('succeed' means follow.)

Suggested Activities

Pair Activity (10 mins)

Learning Outcome: Add numbers up to 6 digits.

Resources: Activity Cards.

Instructions:

- Divide the class into rows and then into pairs.
- Distribute paper chits to all students.
- Ask each student to write any number from 1 to 20 on the given chit and pass it to the partner.
- Ask them to write the Roman numeral for the given number written on the chit.
- The chits can be peer checked in the end.

  There will be a competition among rows, points can be given for each correct answer and the row with the more points wins.

Individual/Pair Activity (20 mins)

Learning Outcome: Identify the place values of numbers up to 6-digits.

Resources: Activity Sheet

Instructions:

- Prepare the worksheet beforehand.
- Have a discussion with the students about place values up to 6 digits.
- Distribute the worksheet in the class and share the expected time to finish the task.

- Share the answers and solve their queries.

Activity Sheet

Identify the place values by shading the ones in green, tens in blue, hundreds in pink, thousands in purple, ten thousands in yellow, and hundred thousands in orange.						
Circle the number that has 4 in the ones place.						
235624	567043	123434	789014	456778	908765	345812
Circle the number that has 6 in the tens place.						
123564	517063	123434	709014	556778	704765	945512
Circle the number that has 8 in the hundreds place.						
456824	789043	987434	234814	456234	978965	134812
Circle the number that has 0 in the thousands place.						
135604	267040	120431	680314	256798	998765	140812
Circle the number that has 2 in the ten thousands place.						
225624	562043	123434	289014	426778	208765	345212

Individual Activity (15 mins)

Learning Outcome: Identify even and odd numbers up to 99.

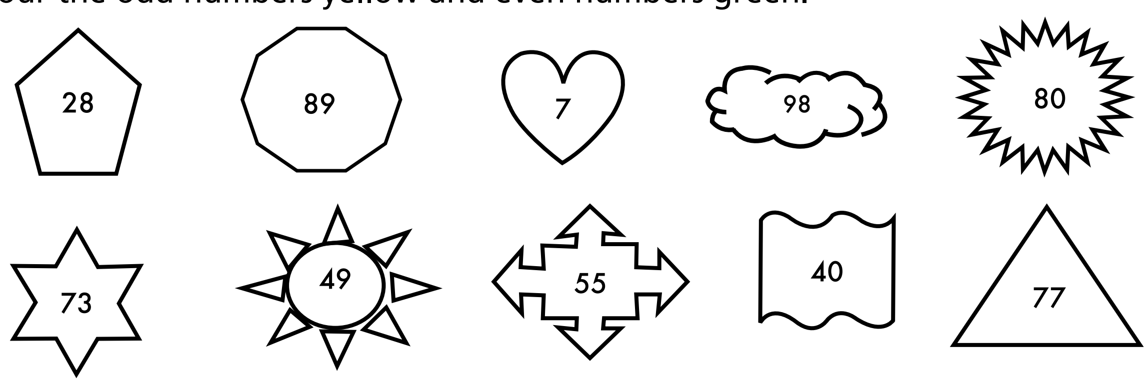
Resources: Activity Sheet

Instructions:

- Reinforce the topic.
- Distribute the worksheet and emphasise the time limit.

Worksheet

Colour the odd numbers yellow and even numbers green.



Individual Activity (20 mins)

Learning Outcome: Represent a given number on a number line.

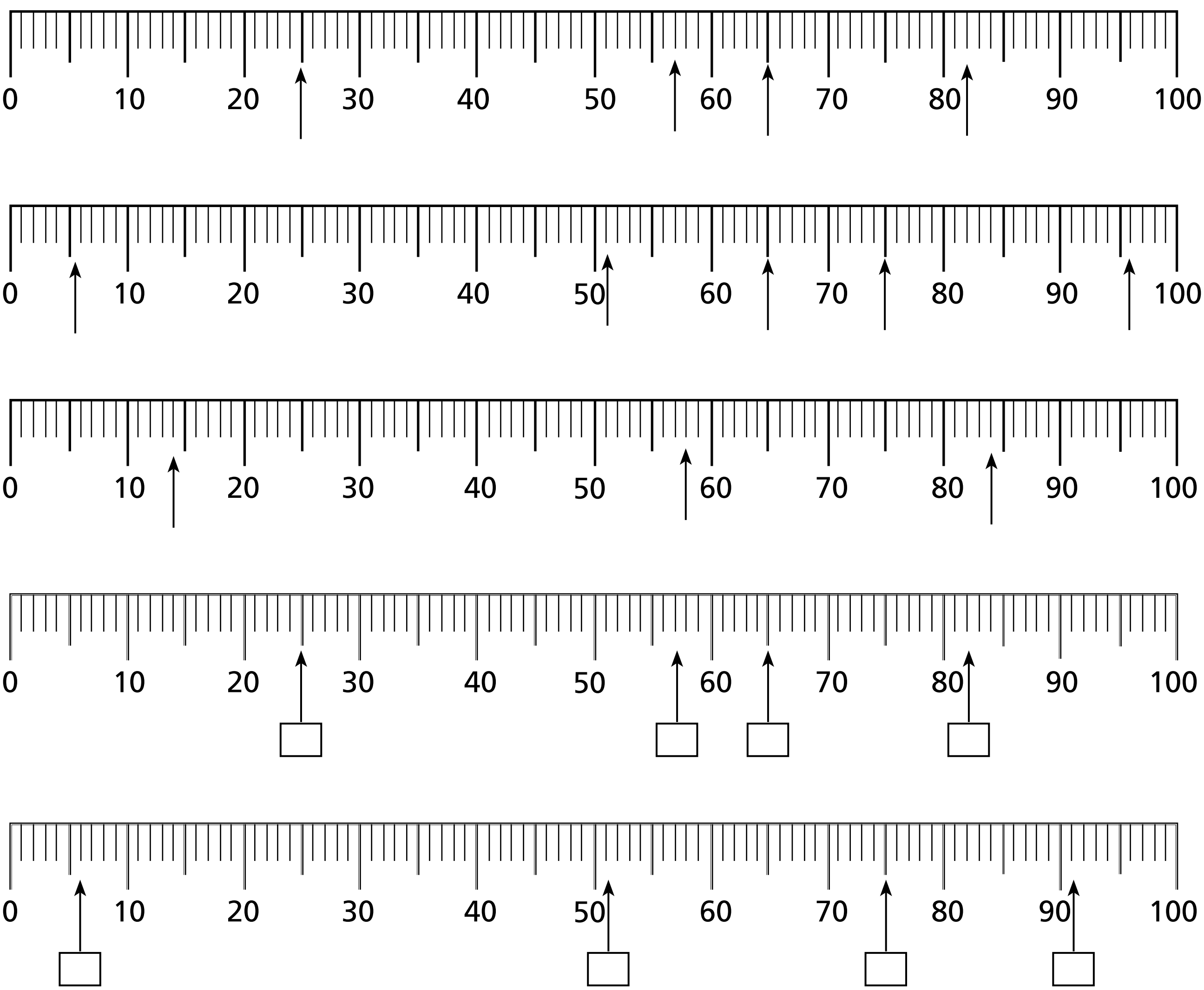
Materials/Resources: Activity sheet

Instructions:

- Revise the topic on the board.
- Distribute the worksheet to each student emphasising time limit.
- After completing the task, ask the students to peer check the activities.
- Call, a few students who have completed the work correctly to share their work with other students.

Activity Sheet

Write the missing values on each of the number lines indicated by arrows.



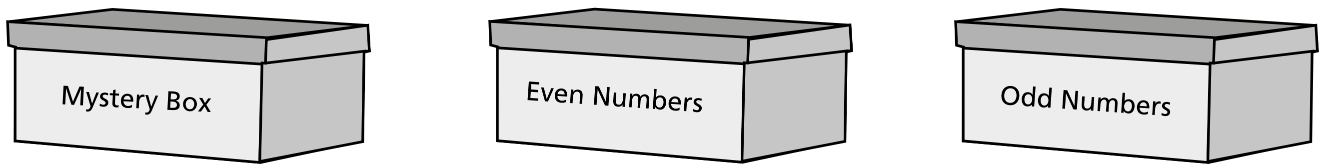
Whole Class Activity (15 mins)

Learning Outcome: Identify even and odd numbers up to 99

Resources: Boxes, Coloured paper chits.

Instructions:

- Fill a box (mystery box) with different numbers (even and odd) written on paper chits.
- Place two empty boxes tagged with even and odd numbers.
- Ask each student to draw a chit from the filled mystery box and place it in the even or odd number box accordingly.
- Check the boxes in the end and explain if there is any wrongly placed chit in any of the two boxes.



Model Lesson Plan

Topic

Roman Numbers 1-20

Duration

80 minutes

Specific Learning Objective

To introduce Roman numbers to children

Key Vocabulary

Roman number, alphabet, Arabic numbers

Resources

A board display with the Roman symbols and their corresponding Arabic numbers, clocks or watches with time written in Roman numbers.

I	1
V	5
X	10
L	50
C	100
D	500
M	1000

Starter: Engagement Activity (5 mins)

The students may have seen Roman numbers on clocks and watches.
Show the students the clocks and watches which have time written in Roman numbers.
Ask them which letters they can see on the clocks and watches. Are they the same on each clock?

Main Developmental Activity (20 mins)

- Introduce Roman numbers to the children, using the board display, based on the diagram on page 3 in Countdown 3.
- Moving from the known to the unknown, tell them that today's number system uses the Arabic numerals.
- Ask the students to find similar numbers in other places, inside or outside the classroom. A smart child may spot it on the watch brought to the class by the teacher, or sometimes in books showing chapter numbers.
- Teach them some ways of remembering the Roman number symbols.
- Tell them the Roman numbers 1-10 written in their symbols is as following:

1	2	3	4	5	6	7	8	9	10
I	II	III	IV	V	VI	VII	VIII	IX	X

Tell them the rules of forming numbers.

When a symbol appears after a larger (or equal) symbol it is added.

Example: VI = V + I = 5 + 1 = 6

Example: XX = X + X = 10 + 10 = 20

But if the symbol appears before a larger symbol it is subtracted.

Example: IV = V – I = 5 – 1 = 4

Example: IX = X – I = 10 – 1 = 9

Don't use the same symbol more than three times in a number.

Children need to be able to do further mental addition, in order to work with Roman numbers.

VIII = 8, and X = 10

XVIII = 18 and MM = 2000

Written Work (20 mins)

Activity: 1, 2,and 3

Wrap up 5 Minutes

Ask them to write their age in Roman numeral on the whiteboard.

2 Numbers Operations

Suggested Time Frame

12-14 periods

Learning Curve

The students are able to add and subtract numbers up to 999. With the help of practical work as well as written sums in these pages, the students will add and subtract numbers with results up to 9999. They learn how to group ones into 10s, tens into hundreds, and hundreds into thousands (carry over sums). The children first subtract 4-digit numbers without borrowing. Next, they convert 1000s to 100s, 100s to 10s, and 10s to ones by 'borrowing' from the thousands, hundreds, and tens columns respectively. The methods are identical, and this transition does not take long.

The children are able to skip-count using the number line. They know their tables to 10, and are able to multiply 3-digit numbers by a 1-digit number. (They already know conversions). Here, they move a step forward and multiply 3-digit numbers by 2-digit numbers with ease.

Children are familiar with multiplication. Division can only be understood if there is a sound knowledge of multiplication and children have had adequate practical exercise in this area.

Children are also familiar with long division. Now, they learn to divide 3-digit numbers, and are introduced to the concept 'remainder', first in practical situations and then in division sums.

Real-life Application

- Numbers are an essential part of our life. Numbers are used in everything we do. We add and subtract all the time without realising it.
- Going shopping involves all the four operations. To work out what we need to pay, we have to add the costs of our purchasing. We need to subtract to know how much we are going to get back if we present a bigger note than the shopping amount. A new car or furniture, or a new sibling in the family is as

addition. For lending some toys to a friend and calculating how many toys will be left, or spending some money and finding out how much money we still have, involves subtraction. Problems about real things that children can see and touch give them real experience of addition and subtraction. Similarly, knowing the cost of one and finding the cost of more will bring experience of multiplication. Similarly dividing and sharing things will give them the idea of division.

Frequently Made Mistakes

- Students make mistakes in carrying and borrowing numbers.
- They make mistakes in times tables.
- They fail to bring down the correct number while performing division.

Summary of Key Facts

- For addition and subtraction of 4-digit numbers, place the numbers correctly under each place value.
- Multiplication is repeated addition.
- Division is equal sharing or equal grouping of numbers.
- The number to be divided is called the 'dividend'.
- The number which divides is called the 'divisor'.
- The result of dividing a number is called the 'quotient'.
- If the number is not fully divided, the remaining number is called the 'remainder'.
- The number which is being multiplied is termed the 'multiplicand.'
- The number which multiplies is termed the 'multiplier.'

Suggested Activities

Pair Activity (20 mins)

Learning Outcome: Add and subtract numbers up to 4 digits vertically and horizontally.

Materials/Resources: Whiteboards, Markers

Instructions:

- Prepare the 4-digit number cards as shown and put them in a basket.
- Divide the students into two groups and each group into pairs.
- Ask each pair to pick two cards.
- Instruct the students that one of the pair will add and the other will subtract the numbers vertically and horizontally.
- Ask them to solve the sums on their whiteboard.
- Ask them to peer check the answers.
- The group with more correct answers will be declared the winner.

Individual Activity (10 mins)

Learning Outcome: Subtract numbers up to 4 digits vertically and horizontally.

Materials/Resources: Mystery Box, Paper Chits

Instructions:

- Fill the mystery box with 4 digit number cards.
- Make cards in such a way that every student can draw two of them from the mystery box.
- Each student to subtract the two numbers written on the cards and find out the difference between them on their whiteboards vertically and horizontally as well.

Individual Activity (20 mins)

Learning Outcome: Multiply a 2-digit number by a 1-digit number.

Materials/Resources: Multiplication table sheet

Instructions:

- Prepare the given multiplication sheet.
- Distribute the sheet in the class.
- Tell the students to revise the times table and complete the worksheet given below.
- Fill in the missing boxes.

	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2		6	4	10			16	18	20		24
3	3	6		12	15	18	21	24	27		33	36
4	4	8	12	16					36	40	44	48
5	5	10	15		25	30	35	40		50	55	60
6	6		18		30			48		60		72
7	7		21		35			56		70		84
8	8	16	24		40	48	56	64		80	1	96
9	9	18	27	36					81	90	99	100

Individual/Pair/Group Activity (20 mins)

Learning Outcome: Solve real life problems involving addition, subtraction multiplication, and division.

Resources: Worksheet.

Instructions:

- Divide the class into pairs.
- Give each pair a worksheet as given below.
- Resolve any confusion regarding the word problems, then ask them to solve.

Worksheet

There are 44 people on the train. At the first stop, 16 more people got on the train. 9 people got off the train. How many people are on the train?

Ali and his father went fishing. Ali caught 17 fish and his father caught 14. If only 24 of the fish stayed in the trap, how many fish swam away?

Javeria has 4 packs of chocolates. Each pack contains 5 bars of chocolate. Draw the bars in each pack. How many bars does Javeria have?

Ambreen is bringing 64 pink balloons and 36 blue balloons to the class party. She wants to divide the pink balloons equally among 8 girls and the blue ones equally among 4 boys. How many balloons does each girl and boy get?

Individual/ Pair Activity (20 mins)

Learning Outcome: Divide a 2-digit number by 1-digit number.

Materials/Resources: Activity Sheet

Instructions:

- Distribute the worksheet to each pair.
- Explain the task and share the time to be taken.

Activity Sheet

Solve the following division problems.

Colour the boxes based on the answers matching to the colour key.

Sky blue : 3, Brown : 4, Pink: 5, Green : 6, Red : 7, Yellow : 8 , and Orange: 9

18 ÷ 2	30 ÷ 10	35 ÷ 5	64 ÷ 8	54 ÷ 9	81 ÷ 9	24 ÷ 6
40 ÷ 5	45 ÷ 5	18 ÷ 3	36 ÷ 6	27 ÷ 3	42 ÷ 7	15 ÷ 3
24 ÷ 4	18 ÷ 6	60 ÷ 10	10 ÷ 2	28 ÷ 7	72 ÷ 9	49 ÷ 7
64 ÷ 8	63 ÷ 7	25 ÷ 5	32 ÷ 4	21 ÷ 3	20 ÷ 5	54 ÷ 9
54 ÷ 6	56 ÷ 7	40 ÷ 8	15 ÷ 5	14 ÷ 2	24 ÷ 3	72 ÷ 8

Model Lesson Plan

Topic

Number Operations

Duration

80 minutes

Specific Learning Objectives

By the end of the lesson students will be able to add and subtract 4-digit numbers.

Key Vocabulary

Addition, subtraction, altogether, totals, and left

Resources

Worksheet, chart papers, and markers, fish cut-outs with attached metal clips, and a fishing rod attached with a magnet at one end.

Strategy

Starter: Engagement Activity (5 mins)

Give them story sums of addition and subtraction as follows:

- Grade 10 students raised Rs 4624 and Grade 9 collected Rs 1118 at the Bake Sale. How much money did they collect altogether?

- Hina takes 5544 bangles to sell at a fair. In one day she sells 666. How many does she have left for the next day?
- Ask them to solve the sums on their whiteboards and hold them up.

Main Developmental Activity

Pair work (30 mins)

- Group the students pairs.
- Place 2 baskets on the table, each basket contains fish cut-outs with three or four digit numbers written on it, such as 20145, 1000, 997 and so on.
- Ask the students of each group to come in pairs and catch one fish from each box.
- Ask each pair to make an addition and a subtraction sum from the numbers written on the fish. One of them will add and the other will subtract showing their answers on whiteboards.

$$\begin{array}{r} 2\ 9\ 8\ 5 \\ +\ 5\ 0\ 7\ 4 \\ \hline \\ \hline \end{array} \qquad \begin{array}{r} 5\ 0\ 7\ 4 \\ -\ 2\ 9\ 8\ 5 \\ \hline \\ \hline \end{array}$$

- The pair which finishes early can have another chance to collect the fish.
- Acknowledge the pair which delivers the maximum number of correct answers.

Written Assignments (40 mins)

Ex 2a Q 4, Ex 2b Q 4

Wrap up (5 mins)

Ask them what would be the answer if they subtract the number of days of a common year from the number of days in a leap year?

3 Fractions

Suggested Time Frame

8–10 periods

Learning Curve

Students already know that a fraction is a part of a whole. They are familiar with $\frac{1}{2}$s and $\frac{1}{4}$s, as used in everyday life. They are gradually introduced to other fractions, starting with the simplest: $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, and, $\frac{1}{5}$ …

With practical work, addition and subtraction of like fractions are also introduced.

Real-life Application

Fractions are used in:

- baking–it tells how much of an ingredient to use.
- telling time; each minute is a fraction of the hour.
- doctor's prescription to tell how much of a medicine, especially the quantity of syrup to be taken.
- games like soccer, football, and basketball, as they are split into halves and quarters.

Summary of Key Facts

- A fraction is a number that represents a part of a whole.
- The lower number indicates the number of equal parts a shape (or a collection) has been divided into. It is called the denominator.
- The top number indicates the number of those equal parts used or referred to. It is called the numerator.
- When the numerator and denominator are multiplied by the same number (except 0), we get an equivalent fraction.
- Fractions with the same denominator are called like fractions.

- In unlike fractions with the same numerator, the smaller the denominator, the greater is the value of the fraction.
- To add like fractions, add only the numerators. The denominator remains the same.
- To subtract a fraction from another like fraction, subtract the smaller numerator from the larger one. The denominator remains the same.

Suggested Activities

Individual Activity (10 mins)
Learning Outcome: Differentiate between proper and improper fractions.

Resources: Paper chits, two empty boxes tagged proper fractions and improper fractions.

Instructions:



- Divide the class into pairs.
- Provide each pair with blank paper chits (4 to 5)
- Each pair will write some proper and improper fractions on the given blank chits and give it to the other pair.
- The other pair will now sort out the proper and improper fractions and place them in the tagged boxes accordingly.
- Make sure every pair has some fractions to sort into boxes.
- Check the boxes in the end for any wrong placements.

Individual Activity (10 mins)
Learning Outcome: Write the fractions of the shaded area.

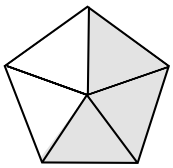
Resources: Activity Sheet

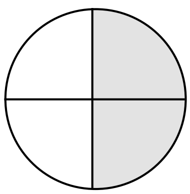
Instructions:
- Distribute the activity sheet to the students.
- Have a discussion of basic knowledge about fractions.
- Instruct the students to complete the work in a prescribed time.

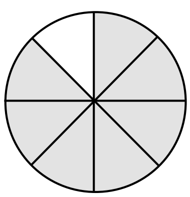
Activity Sheet

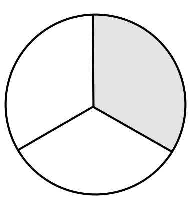
What is the fraction of the shaded area?

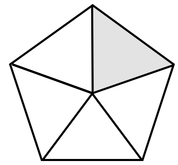
1) 

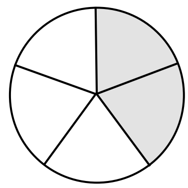
2) 

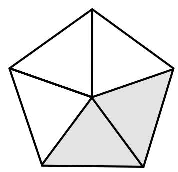
3) 

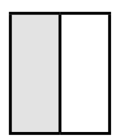
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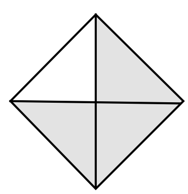
5) 

6) 

7) 

8) 

9) 

10) 

Individual Activity (20 mins)

Learning Outcome: Identify equivalent fractions from the given figures.

Resources: Activity Sheet

Instructions:

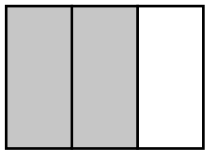
- Recall the concept of fractions with different denominators.
- Distribute the activity sheet.
- Ask them to solve carefully in a given time.
- Get them peer checked.

Activity Sheet

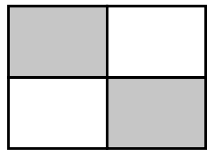
1)



$\frac{1}{2}$

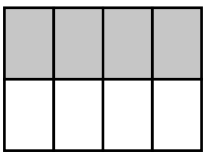


$\frac{2}{3}$



$\frac{2}{4}$

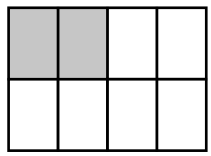
2)



$\frac{4}{8}$

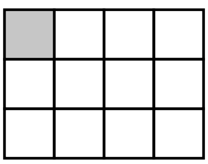


$\frac{1}{4}$

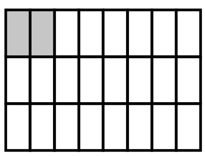


$\frac{2}{8}$

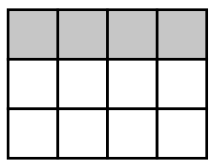
3)



$\frac{1}{12}$



$\frac{2}{24}$



$\frac{4}{12}$

Individual Activity (20 mins)

Learning Outcome: Identify equivalent fractions from the given figures.

Resources: Activity Sheet

Instructions:

- Recall the concept of fractions with different denominators.
- Distribute the activity sheet.
- Ask them to solve carefully in given time.
- Get them peer checked.

Activity Sheet

Shade the fraction strips to show the given fractions. Then compare each pair of fractions using the symbol < , > or =

a.

$\frac{1}{3}$		$\frac{1}{3}$		$\frac{1}{3}$	
$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$

$\frac{2}{3}$ ◯ $\frac{5}{6}$

b.

$\frac{1}{2}$					$\frac{1}{2}$				
$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$

$\frac{1}{2}$ ◯ $\frac{3}{10}$

c.

$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$
$\frac{1}{4}$		$\frac{1}{4}$		$\frac{1}{4}$		$\frac{1}{4}$	

$\frac{6}{8}$ ◯ $\frac{3}{4}$

d.

$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$
$\frac{1}{2}$			$\frac{1}{2}$		

$\frac{5}{6}$ ◯ $\frac{1}{2}$

e.

$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$
$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$		

$\frac{7}{12}$ ◯ $\frac{7}{10}$

f.

$\frac{1}{5}$		$\frac{1}{5}$		$\frac{1}{5}$		$\frac{1}{5}$		$\frac{1}{5}$	
$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$

$\frac{4}{5}$ ◯ $\frac{8}{10}$

Model Lesson Plan

Topic

Fractions

Duration

80 minutes

Specific Learning Objectives

By the end of the lesson students will be able to revise the concept of 1/2 and ¼, moving to other fractions such as 1/8 and 1/10.

Resources:

Strip of papers, differently coloured circles.

Key vocabulary

Numerator, denominator, equal, halves, quarters, like fractions, and unlike fractions.

Strategy

Starter: Engagement Activity (5 mins)

Begin with a recapitulation of fractions, using a story and build up more stories on the rest of the fractions.

For example, Mamma Bear spread some chocolate sauce over a crusty pie cut in quarters. She put it on one quarter for Baby Bear, one for Papa Bear and one for her own share. How many quarters did she put the sauce on? How many quarters did not have any chocolate sauce? The answer is three quarters or $\frac{3}{4}$; and one-quarter or $\frac{1}{4}$

Main Developmental Activity (20 mins)

- Introduce students to other fractions with the use of strips of paper or coloured circles.
- Use one shape at a time, but the same fraction must be demonstrated with different shapes, so that children see a fraction associated with any shape or any set of objects.
- Associate the fractions and fraction names.

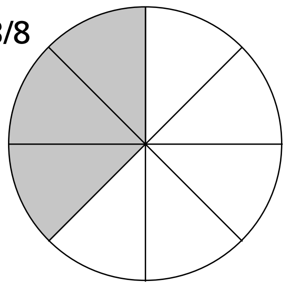
2	equal parts:	2	halves in a whole
3	equal parts:	3	thirds in a whole
4	equal parts:	4	quarters in a whole
10	equal parts:	10	tenths in a whole
100	equal parts:	100	hundredths in a whole

- Demonstrated the same, using pictures and finally the children move on to calculating with numbers alone.

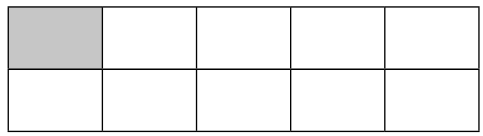
Individual Activity (15 mins)

- Draw two shapes on the board, divided into 8 and 10 equal parts respectively.
- Shade a few parts in each.
- Help them to read and identify the coloured part of the shapes as fractions.
- Guide them to understand that coloured parts divided by total number of pars represents the fraction of the coloured part in a shape.
- Help them to read and identify the coloured part of the shapes as fractions
- Guide them to understand that coloured parts divided by total number of pars represents the fraction of the coloured part in a shape.

3/8



1/10



- Help them to work with fractions drawn on paper in different shapes, and colour fractions of a whole or identify the coloured fraction.
- Provide different material like different shapes of cut-outs with card, paper, strings, blocks, beads, or wooden blocks to work out fractions.

Written Assignments (35 mins)

Ex 3a Q 4, 5, and 7

Wrap up (5 mins)

Ask them if they have 10 T-shirts of different colours and two of them are blue. What fraction of the T-shirts is blue?

4 Money

Suggested Time Frame

8-10 periods

Learning Curve

The students know how to add rupees. They have been shopping in the classroom shop. They are aware that 100 p = Re 1.

After a quick revision exercise, children work with small amounts of money, and document their 'shopping' with rupees and paise written in separate columns, as shown:

	Rs	Paise
Bar of chocolate	45	50
Box of Twisters	100	75
Pair of shoes	349	25

Then, these sums are written with a 'point' between Rupees and Paise (The word 'decimal' is not used at this stage.) and are written as follows:

Rs 45.50

Rs 100.75

Rs 349.25

Children learn to convert rupees into paise, and vice-versa. Finally, they use the four operations which are useful in everyday life.

Real-life Application

In our daily life money plays an important role. We often find that things we buy or the bills we pay have a price which is expressed in both rupees and paise. For example, a restaurant bill is Rs 1550.50

The cost of a toy car is Rs 550 and 1 kg of grapes is Rs 360.75 etc. We pay money to settle utility bills, house rent, taxes etc.

Summary of Key Facts

- Instead of writing the price as Rs 78 and 50 p which takes up a lot of space, we usually write Rs 78.50.
- To convert rupees and paise to paise only, just remove the point.
- To convert paise into rupees and paise, start from the right, count 2 digits to the left, then put a point.

Suggested Activities

Individual/ Pair Activity (20 mins)

Learning Outcome: Convert units of money.

Resources: Worksheet

Instructions: You can use this activity as a starter activity before starting the main developmental activity or could also be used as a part of main developmental activity:

- Discuss the conversion of units of money.
- Distribute the worksheet to the students.

Convert these sums of money into paise.		
	=	
	=	
	=	
	=	
	=	
 +  + 	=	

Group Activity (20 mins)

Learning Outcome: add and subtract units of money

Resources: Paper Money, Paper products such as food items, clothing etc. (tagged with price). Paper products can be made by students as well if there is no time constraint.

Instructions:

- Divide the class into 2 groups : Buyers and Sellers
- Provide the sellers with the selling items made of paper and tagged with price.
- Provide the buyers with paper money i.e. notes and coins.
- Set up stalls in the class for the role play and supervise it.
- Students will learn to add and subtract units of money with this activity.
- Make sure the items have prices such as Rs 15.50 or Rs 340.25 etc.

Individual Activity (10 mins)

Learning Outcome: Solve real life problems involving money

Resources: Activity sheet

Instructions:

- Prepare the activity sheet for the whole class.
- Ask short questions about the topic.
- Clear any ambiguity.
- Distribute the activity sheet.

Activity Sheet

Kainat lost her eraser yesterday. She had Rs. 50 left over from her lunch money. She went to the school store to buy a new eraser for Rs. 35.50. How much change did she get back?	
Who Who is the person in the word problem?	
Problem What is the problem?	
Solution How is the problem fixed?	
What did she buy? Name the item and how much does it cost?	
Question What is the word problem asking you?	
Answer What is the answer?	

Individual Activity (10 mins)

Learning Outcome: Multiply units of money

Resources: Worksheet

Instructions:

Cost of 1 T-shirt is Rs 650.50



Cost of 5 T-shirts = ☐

Individual Activity (20 mins)

Learning Outcome: Divide units of money.

Resources: Activity Sheet

Instructions:

- Divide the class into groups. Each group will have four members.
- Assign roles to different students within the group. One will read the question, the other will read it to the rest of the members, another member will write or solve with the help of the all team members and yet another member can present to the class.

Activity Sheet

Ahmed collected some money from his friends to distribute it to the children of an orphanage. He had Rs 534.46. He decided to give it to 10 children in the orphanage. How much money did each child get? What if he takes Rs. 65.54 from his mother to generate more funds? How much money does each child in the orphanage receives now?

Solution:

Model Lesson Plan

Topic
Money

Duration
80 minutes

Specific Learning Objectives
By the end of the lesson students will be able to apply four operations on real life problems involving money.

Resources
Empty menu cards

Key Vocabulary
Rupee, paisa, point, cost, spend, buy, sell, and price

Strategy
Starter: Engagement Activity (5 mins)

Ask the students to check the price of their maths book and find the cost of 5 maths books.

Main Developmental Activity
Group Activity (30 mins)

Visiting a restaurant

- Divide the class into groups.
- Ask one group to make menu cards, with prices for the restaurant.

Chicken corn soup	1 bowl	Rs 50
Crispy baby-corn	1 plate	Rs 25
Fruit platter	1 plate	Rs 40

- Ask the other group to visit the restaurant and place the order.

Chicken corn soup	2 bowls
Crispy baby-corn	3 plates
Fruit platter	2 plates

- Ask next group to make the bill.
- Guide them in making the bill and calculating the amount.
- Solve the same bill on the board so that they can also check whether they have made the bill correctly.

Written Assignments (40 mins)
Ex 4 Q 15 and 16

Wrap up (5 mins)
End your lesson by asking students the importance of four operations in daily life?

5 Measurement

Suggested Time Frame

16 periods

Learning Curve

Children are able to convert:

- metres to centimetres and kilometres to metres
- kilograms to grams
- litres to millilitres.

They are able to solve word problems involving addition and subtraction with length, weight and capacity. (Children are already familiar with the use of the four operations, working with 4-digit numbers.)

Now they will learn to add and subtract the units of measurement with carrying the smaller unit to the bigger unit, and borrowing by the bigger unit.

Real-life Application

- Units of length are used to measure the distance, to find height, length, and breadth.
- Units of weight are used at grocery shops, doctor's clinic, hospitals, and markets.
- Units of capacity are used to measure liquids like water, juices, milk, and smoothies etc.

Frequently Made Mistakes

- Students get confused in conversion factors.
- They make mistakes when converting smaller unit to bigger unit.

Summary of Key Facts

- We can use a short form for the standard units of measurements.

kilometre	= km	metre	= m
centimetre	= cm		
kilogram	= kg	gram	= g
litre	= l	millilitre	= ml

1km	= 1000m
1 m	= 100 cm
1 kg	= 1000 g
1 l	= 1000 ml

Suggested Activities

Group Activity (20 mins)

Learning Outcome: Write standard units of length in abbreviations.

Resources: Cards with different length, weight, and capacity with units in full form for example, 5 kilometres, and a tic tac toe board made on a sheet of chart paper

Instructions:

- Students are divided into two groups, named 'Os' and 'Xs'.
- They are each given a bunch of measurement cards.
- To place their mark on the tic tac toe board, players have to pick one measurement card, read it, and then record the unit of measurement in the abbreviation on the tic tac toe board.
- Continue until someone wins or all spaces are filled.
- You can make several groups of 'Os' and 'Xs' and have this competition between them.

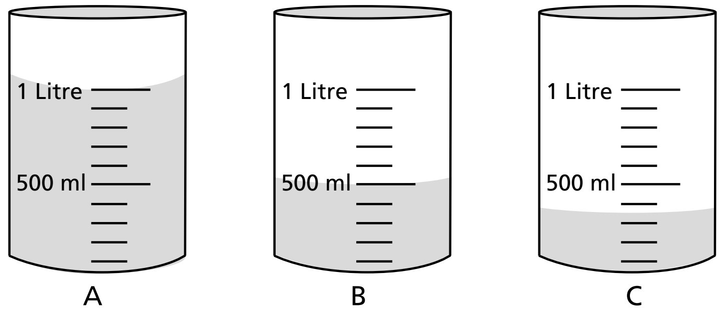
Individual Activity (15 mins)

Learning Outcome: Read standard units of volume.

Resources: Activity sheets

Instructions:

Use the clues to work out who has which container.		
Ayesha	I have exactly half a litre	
Ahmed	I have 1,000 ml	
Areeba	I have more than 300 ml but less than 400 ml	



Individual Activity (20 mins)

Learning Outcome: Solve real life problems involving the same units of length, mass and volume.

Resources: Worksheet

Instructions:

- Prepare the given worksheet for the whole class.
- Revise units of length, weight, and capacity orally.
- Discuss the addition and subtraction of units of measurement.
- Distribute the worksheet and provide help where needed.

To make Fruit Punch for 2 people, we need : o 300 ml of pineapple juice o 250 ml of orange juice o 500 ml of lemonade • How much liquid is used in total to make Summer Punch for 2 people? • How much orange juice would be needed to make enough for 4 people?
Dania buys two apples and three bananas. One apple weighs 75 g. Three bananas weigh the same as two apples. How much does one banana weigh?

Model Lesson Plan

Topic

Measurements

Suggested Duration

2 Periods

Specific Learning Objectives

By the end of the lesson students will be able to add and subtract with accuracy, using units of length (m, cm), weight (kg, and g).

Key Vocabulary

Length, weight, metre, centimetre, kilogram, and gram

Resources:

Pieces of ribbons, small buckets, various containers of different shapes

Strategy

Starter: Engagement Activity (5 min)

Reinforce the bigger and smaller units of length, weight, and capacity with abbreviations.

Main Developmental Activity (20 mins)

- Divide the students in pairs.
- Set up the classroom in such a way that it provides a large number of things for measurement and measuring equipment too.
- Ask one child to guess the length of a piece of a ribbon and the rim of a bucket, and the other to write it down. Then, ask them to take actual measurements and decide whether the guesses were correct or not.
- Similarly, ask the students to try and guess the capacity of containers of different shapes and sizes. Will a tall vase hold more water than a flat plate? By how much?
- Ask them to hold a papaya in one hand and a banana in the other hand. Ask them to say which is heavier? Can they guess by how much?
- Now move to addition.
- Write the following word problem on the board and ask them to solve it.

'A lorry is carrying 4 cars, one on top of the other. The floor of the lorry is at a height 1 m 10 cm from the road surface. The three cars (without wheels) are 1 m 30 cm high. Will the lorry be able to go under a flyover, which is 8 m from the ground?'

Record the addition, with m and cm in separate columns.

- Then move to subtraction. Write the following word problem on the board.

'Cut a 4 m 2 cm piece of ribbon from a 7 m 20 cm long one. How much is left?'

Find the difference between the heights of two students in the class.

- Ask them to solve these problems in their school notebook.
- Check the work of each student thoroughly and provide guidance where needed.

Written Assignments (30 mins)

Page 155 Word problems

Wrap up (5 mins)

Add 5 kilogram to 230 grams.

Ask them to write the answers on their white boards using abbreviations for units.

6 Time

Suggested Time Frame

8-10 periods

Learning Curve

Students are familiar with the clock-face and know how to read time half past the hour, quarter past the hour and on the hour. They have a fair idea about simple fractions, and are able to skip-count in fives.

students are able to read time in hours, and, with some help, in minutes. With a little practice, they will be able to use a.m. and p.m. and read the clock face accurately.

Real-life Application

Time is an important factor in our lives. We find time in all walks of our lives.

- Time management is important for students to do the study with focus and getting good grades.
- We mention time in occasions, events, functions, meetings, gathering, parties, and congregations.
- To be punctual is vital for a successful life.

Summary of Key Facts

- There are two types of clocks i.e. digital and analogue. Analogue clocks may have Roman numbers I to XII also. A digital clock has digits to tell the time.
- There are two types of calendars (solar and lunar). Solar calendar is based on the movement of the Sun. Lunar calendar is based on the movement of the Moon.
- January, March, May, July, August, October, and December have 31 days.
- February either has 28 days and 29 days in leap year.
- A leap year has 366 days and comes after every 4 years.
- 24 hours=1 day
- 7 days=1 week

- 14 days = 1 fortnight
- 30 days = 1 month
- 12 months =1 year
- 10 years = 1 decade
- 100 years = 1 century
- 1000 years = 1 millennium

Suggested Activities

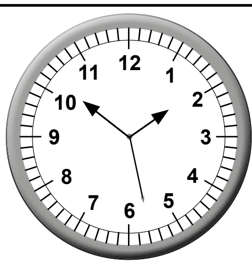
Individual Activity (20 mins)

Learning Outcome: read and write time from analog and digital clocks.

Resources: Activity sheet, digital clock, analogue clock

Instructions:

- Two clocks can be shown in the clock (one analogue and one digital) and questions can be given about them. The teacher can also keep changing time on the clocks and give different questions to each pair or group.

Answer the following questions, using the clocks shown below:
 
1) What is the time shown in the analogue clock?
2) What is the time shown in the digital clock?
3) How is 7:00 before noon written?
4) How is 5:00 after noon written?
5) What time will it be on the analogue clock in 3 hours?
6) What time was it on the digital clock 25 minutes ago?

Individual Activity (20 mins)

Learning Outcome: Read and write days and dates from the given calendar page.

Resources: A page of calendar, activity sheet

Instructions:

- Prepare the activity sheet for the whole class.
- Show the page of a calendar to the students.
- Ask few questions related to day and date.
- Distribute the activity sheet and ask them to solve it carefully.

Answer the following questions, using the calendar shown below:

January 2020						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

1)	Which day of the week is January 7? ____________
2)	How many Wednesdays are there in January 2020? ____________
3)	What is the 3rd Tuesday of January? ____________
4)	What date falls 11 days before January 23? ____________
5)	Choose any date in the second week of January. Write it in two ways:

Pair Activity (15 mins)

Learning Outcome: Add units of time in hours.

Resources: Activity Sheet

Instructions:

- Divide the class into pairs.
- Distribute the following activity sheet to solve.

Paras and Bina ate brunch from 11:00 a.m. to 12:30 p.m. How long were they eating brunch? ________ hours ________ minutes.
Maya put her cake in the oven at 6:30 p.m. The cake baked for 2 hours and 30 minutes. What time did she take the cake out? ____________

Group Activity (15 mins)

Learning Outcome: Subtract units of time in hours.

Resources: Activity sheet

Instructions:

Ali and Ahsan arrived at the mall at 3:10 p.m. Since there was so much traffic, it took them 40 minutes to get there. What time did they start driving to the mall?

Aliya's homework ended at 6:15 p.m and it took her 1 hour 45 minutes to finish it, what time did she start doing her homework? ____________________
If she wants to finish her homework half an hour earlier, when should she start ? ____________________

Group Activity (20 mins)

Learning Outcome: Solve real life problems involving addition and subtraction of units of time in hours

Resources: Activity Sheet

Instructions:

- Divide the class into groups of 4-5
- Give each of them the activity sheet provided below where they record their daily schedule and then bring it back the next day to discuss it with their group partners and compare their schedules.
- Discuss the areas where they think they need to reschedule to save time in order to use it constructively.

My Daily Schedule
1) How long do I sleep at night? ____________
2) How long do I spend in the recess at school? ____________
3) How long do I study/do my homework at home? ____________
4) How long do I watch television / use my tablet? ____________
5) How long do I play with my siblings/friends? ____________
6) How long do I spend at the dinner table? ____________
7) How long do I spend in school daily? ____________
8) How long do I spend on reading a book every night? ____________

Model Lesson Plan

Topic
Time

Duration
80 minutes

Specific Learning Objectives
Children learn to measure time by minutes and hours with the intervals of fives, and learn the use of a.m. and p.m.

Key Vocabulary
Clock, hour, minute, past, p.m. (post meridiem), a.m. (ante meridiem)

Resource
Clock with the long, minute hand and the short, hour hand.

Strategy
Starter: Engagement Activity (10 mins)

Recapitulate the concepts of 'half past', 'quarter past' and 'quarter to' the hour. It will be helpful and serves as a base to start newer concepts.

Main Developmental Activity (30 mins)

- Point out the 60 small divisions on the clock.
- Tell them each division represents a minute.
- Now make them understand when the minute hand goes all around the clock face, 60 minutes have passed or an hour has passed. The minute hand goes once around the clock face in one hour.
- Show them the movement of the hour hand. It moves only 5 spaces on the clock face from 1 to 2, or 2 to 3, or 3 to 4 and so on.
- Now explain that the numbers around the clock-face act like numbers on a number line: they are always skip-counting in 5s as it takes 5 minutes to move from one number to the other.
- Show them, if the minute hand is on 8, it means '40 minutes past the hour' revise 8 times 5s is 40.
- Now move the minutes hand on to different numbers, asking the students the minutes past.

  Children are aware that a day has 24 hours.
- Explain that the time from 12 midnight to 12 noon is called a.m. which means 'in the morning' (in Latin, ante meridiem means 'before noon') and between 12 noon and 12 midnight is called p.m. (in Latin, post meridiem means after noon)

Give them a list of exercises, where children use a.m. or p.m.

Bath time: 7 (some might say 'a.m.' some might say 'p.m.')

Bed time: 8 p.m. (cannot be 8 a.m.)

Lunch time: 12 noon

Play time: 4 p.m. (at 4 a.m. children should be asleep.)

Written Assignments: (35 mins)

Page 166 Practice worksheet, Page 172 Q7 (a-i)

Wrap up: (5 mins)

Ask them to draw a clock in their notebook and show the time 6 hours 45 minutes on it.

7 Geometry

Suggested Time Frame

8-10 periods

Learning Curve

Students recognise 3-D objects and their names. They are aware of the number of faces, edges and vertices each shape has. At this level they are introduced to terms such as parallel lines, points, line segments, and the calculation of the perimeter of shapes.

Real-life Application

The global positioning system of satellites uses geometrical principles to calculate the position of the satellites. Geometry helps in the field of medicine e.g. X-ray and ultrasound. Geometry also helps in the accurate calculation of physical distances. It helps in the field of astronomy to map the distance between planets and stars. Geometry is used in computer aided designs, it entails lines, curves, and angles. Geometry plays an important role in designing buildings, walls, and doors.

Frequently Made Mistakes

- The students make mistakes in identifying the different types of lines.
- They confuse the names of different shapes.

Summary of Key Facts

- A line is a set of points joining a straight path on both sides.
- A line segment is a line which joins 2 points together.
- A ray is similar to a line segment but one end point extends infinitely in one direction.
- Parallel lines are two lines which never meet. The distance between the two lines remains the same.
- Shapes with 3 sides are called triangles. They have 3 sides and 3 corners.

- Shapes with 4 sides and 4 corners are called quadrilaterals.
- There are different types of quadrilaterals: Square, rectangle, rhombus, parallelogram, and kite.
- Polygons are those figures which have many sides.
- A circle is a flat round closed shape with no corners or edges. The curved line is the boundary of the circle.
- The length of the boundary of a circle is called its circumference.
- A centre is a fixed point inside a circle which is equidistant from all the points on the circumference.
- A radius is a line joining the centre point and any point on the circumference of the circle.
- The diameter is a line passing through the centre and joining two different points on the circumference.

Suggested Activities

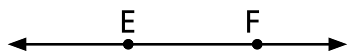
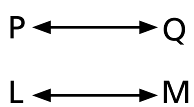
Individual Activity (15 mins)

Learning Outcome: Recognise point, line segment and ray.

Resources: Activity sheet

Instructions

- Distribute the activity sheet.
- Ask the students to write the answers in the box.

Identify the following and name them.	
	
	
	
	
Draw a figure using the lines given above:	

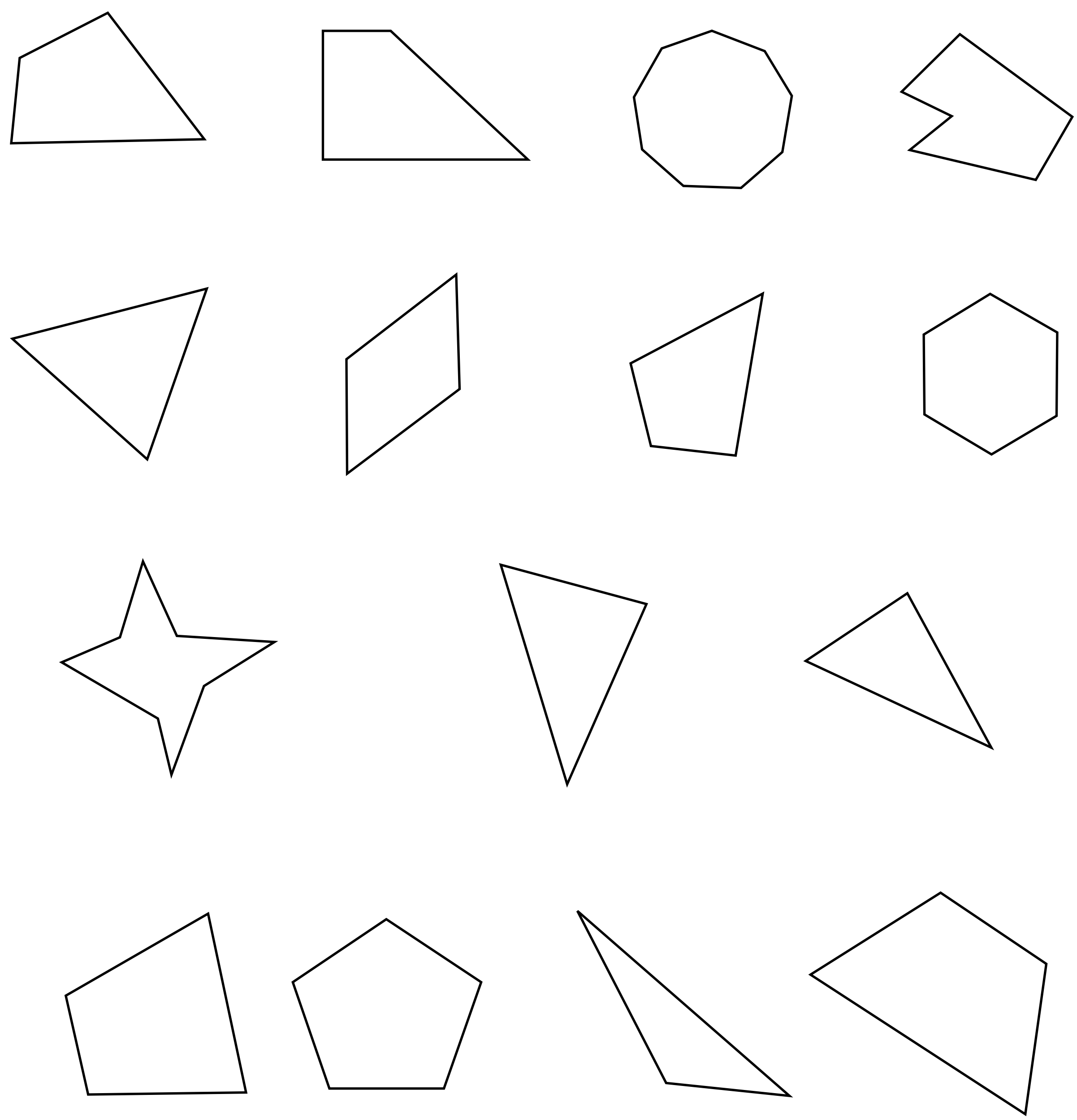
Pair Activity (15 mins)

Learning Outcome: Classify figures as quadrilaterals, polygons and triangles.

Resources: Activity Sheet

Instructions:

Color the quadrilaterals red, triangles green, and polygons yellow.



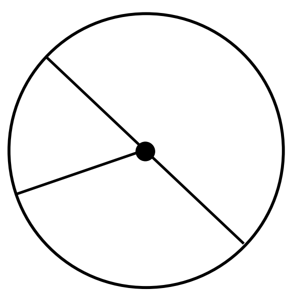
Individual Activity (15 mins)

Learning Outcome: identify circle, its radius, circumference and diameter.

Resources: Activity sheet

Instructions

- Discuss the topic with the students.
- Recall the definitions of the parts of circle.
- Distribute the activity sheet and ask them to solve.

Answer the questions given below:
I am represented by a dot in the middle of the circle. I am the ______________________.
I am the distance around the circle. I am the ______________________.
I am a straight line segment with endpoints on the centre and the circumference. I am the ______________________.
I am a straight line segment passing through the centre of the circle and my endpoints both lie on the circumference. I am the ______________________.
Label all parts of a circle on the diagram given below: 

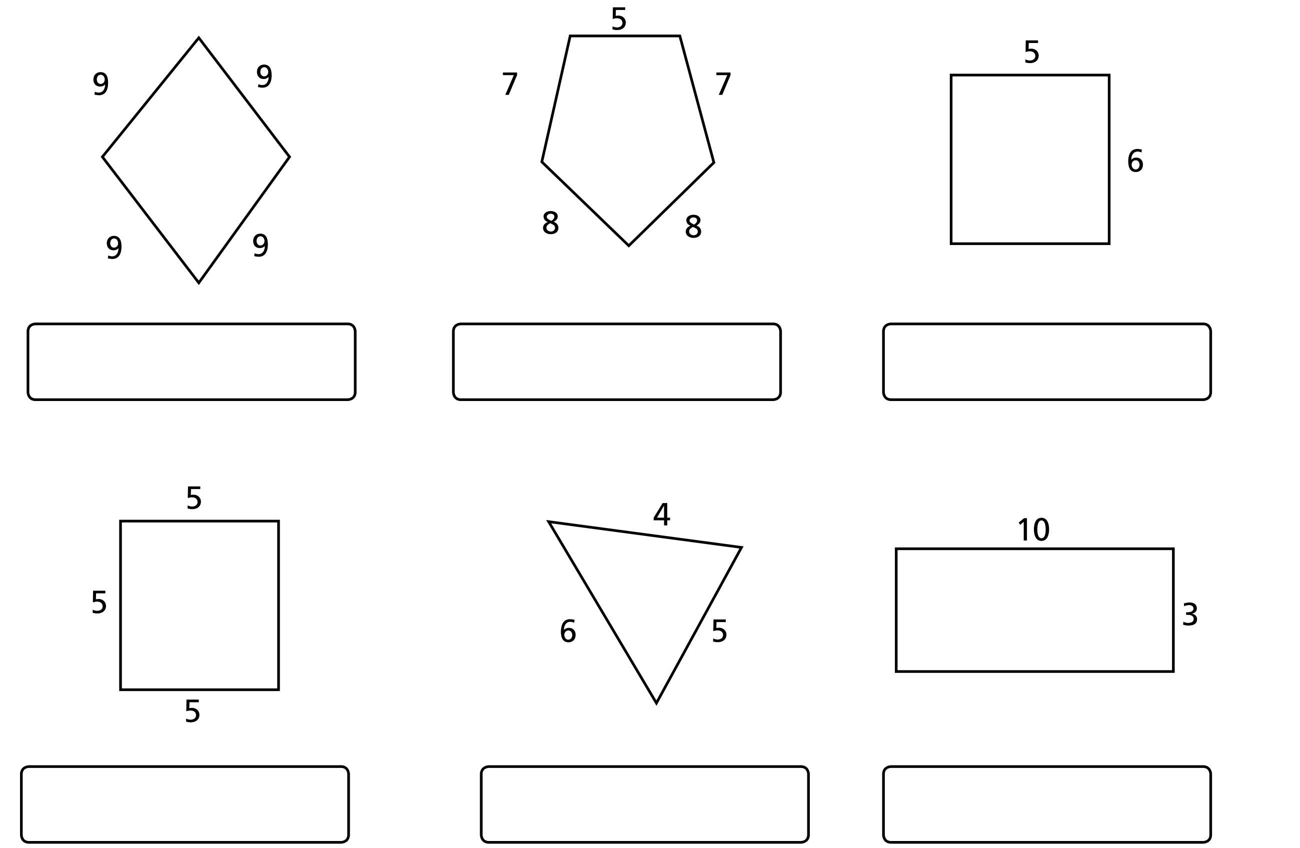
Group Activity (20 mins)

Learning Outcome: calculate perimeters of squares, rectangles and triangles.

Materials/Resources: activity sheet

Instructions:

Amina needs to find the shape with the largest perimeter. Help her find the perimeter of each shape, then colour the largest one. All the measurements are in cm.



Class Activity (15 mins)

Learning Outcome: Revision of all concepts of geometry

Resources: Mystery Box, Paper chits

Instructions:

- Fill up the mystery box with paper chits that have questions written on them e.g.
  - ➢ Draw a square with perimeter equal to 28 cm.
  - ➢ Draw a line segment.
  - ➢ Draw a ray.
  - ➢ Spot a quadrilateral around you.
  - ➢ Write down the parts of a circle.
- Ask each student to draw a paper chit from the box and solve the question written on the drawn chit.
- Ask them to exchange the paper with their partner and check the answer.

Model Lesson Plan

Topic

Quadrilaterals

Suggested Duration

80 minutes

Specific Learning Objectives

By the end of lessen students will be able to name 4-sided shapes and their properties.

Key Vocabulary

Quadrilateral, parallel lines, rhombus, parallelogram, and vertices

Resources

Classroom objects, pictures of objects with parallel lines, and strips of paper.

Strategy

Starter: Engagement Activity (5 mins)

After a revision of 3-D shapes, discuss some examples of parallel lines from everyday life such as railway tracks, roller coaster tracks, and the two sides of a road or edges of a board, a TV screen, a desk or a door frame. Ask the students to observe that the railway lines are parallel because they never meet.

Main Developmental Activity

- Tell them that certain shapes too have parallel sides, such as squares, rectangles and diamonds. A triangle cannot have parallel sides.
- Assign the students to identify shapes and objects in the classroom which have parallel lines.
- Give them strips of paper to construct 4-sided shapes (quadrilaterals: quadri means 'four') with parallel sides.
- Introduce the names of some quadrilaterals such as rhombus, parallelogram, and kite as they already know about square, and rectangle.
- Draw the above mentioned shapes on the board and teach them about the corners and the sides of each.
- Introduce the word 'polygon' defined as shapes with at least three sides or more.
- They know that a 4 sided figure is a quadrilateral. Tell them about the pentagon (5 sided), hexagon(6 sided), and octagon (7 sided).

Written Assignment (40 mins)

Ex 7 a Q 8 (a, b, c, d, e, and f)

Wrap up (5 mins)

Ask them to do the activity, 'Let us practise' on page 188.

8 Handling Information

Suggested Time Frame

4-6 periods

Learning Curve

This unit provides an introduction to data handling. The three steps of data handling are collection, organisation and interpretation of data. In this unit they are going to learn that a picture graph, or pictograph, is used to display information that uses images or symbols to represent data. Moreover, the students will also learn about the column graph in which the information from data is illustrated with horizontal columns.

Real-life Application

- Pictograph uses pictures and symbols to represent information or quantities.
- A column graph is used to show data comparison. For example, comparison of rainfall in different cities of a country or comparison of yields of a crop in the last two years.

Frequently Made Mistakes

- Students make mistakes in counting the objects.
- Sometimes they are note able to decide which quantity should be taken on vertical line and which quantity should be taken on horizontal line.

Summary of Key Facts

- A pictograph, or a picture graph, is a pictorial representation of data.
- Column graphs also represent data.

Suggested Activities

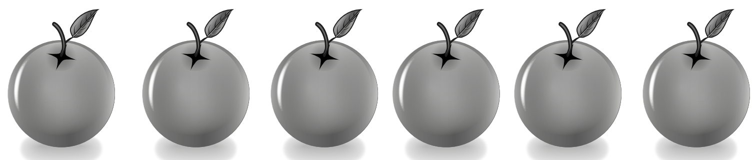
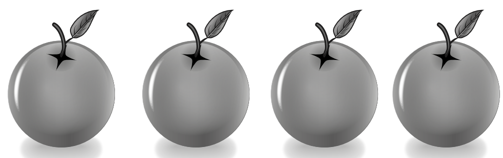
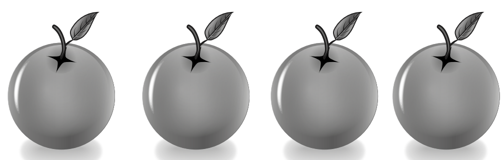
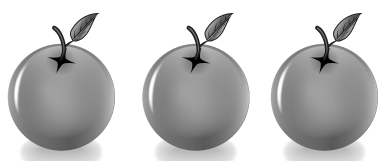
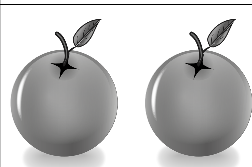
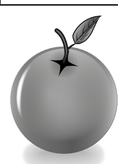
Pair Activity (20 mins)

Learning Outcome: Read and interpret a picture graph.

Resources: Activity sheet

Instructions:

Orange season has begun, and the farmers are busily picking their oranges. The numbers of oranges are shown in the picture graph below. Note each orange in the pictograph stands for 15 oranges picked. Use the information provided to answer the questions.

Day	Oranges picked
Day 1	
Day 2	
Day 3	
Day 4	
Day 5	
	 = 15 Oranges

1)	How many oranges did the farmer pick on the fourth day ________________
2)	Which day did the farmer pick the most oranges? ________________
3)	Which days did the farmer pick the same amount of oranges? How many did he pick in total on both of those days? ________________
4)	What is the difference between the number of oranges picked on Day 3 and Day 4? ________________
5)	How many oranges in total did he pick for this season? ________________

Individual Activity

Learning Outcome: Make a picture graph.

Resources: Activity sheet, squared paper, stickers of smiley faces.

Instructions

- Prepare a data sheet for the students.
- Ask the students to note down the number of students who liked each game.
- Tell them to paste one smiley face for one student in the given squared paper.
- At the end of the week make a picture graph.
- Prepare few questions related to the pictograph made by the students.

Data:

Favourite games	Numbers of students
Football	9
Tennis	3
Volley ball	5
Cricket	8

Pictograph

Football										
Tennis										
Volley ball										
Cricket										

Each smiley ☺ stands for 1 student.

Model Lesson Plan

Topic
Graph

Suggested Duration
80 minutes

Specific Learning Objectives
By the end of the lesson students will be able to represent the information in a bar graph.

Key Vocabulary
Data, bar graphs

Resources
Chart paper, markers

Strategy
Starter: Engagement Activity (5 mins)

Ask the students to hold different colour pencils and make data of the number of pencils of each colour.

Main Developmental Activity (25 mins)
Instructions:

- Talk to your students about the importance of having breakfast in the morning. Discuss healthy options for breakfast.
- Give one paper plate to each student.
- Ask students to write down what they had for breakfast that morning, and to draw a picture of it.
- Ask the students who did not have breakfast to write ‘nothing’.
- Group the breakfast items into categories such as ‘milk and cereal’, ‘fruits’, ‘toast’, ‘eggs’, etc.
- Explain that a bar graph will make it easy to organise the students’ responses.
- Divide the students into 4 groups.
- Each group will sort out and organise the data by gathering all plates which represent the same category of breakfast, for example milk and cereals by one group.
- Spread the chart paper on the board.

- Call out each group one by one. They will tell the data of the particular category which they had on their table.
- Draw a bar for the particular breakfast category on the chart paper.
- Repeat the same steps for each of the remaining categories. Analyse the bar graph and discuss the data.
- Write 5 questions on the board such as:
  1) How many students had cereal in the morning?
  2) Which food was liked by most of the students?
  3) How many students did note have breakfast?
- Encourage students to find the answers from the graph, write them on whiteboards, and share with their partners.

Written Assignments (45 mins)

Ex 8 Q (1-5)

Wrap up (5 mins)

Discuss the answers found by the students with the whole class.

Teacher Notes